

### **Remarks**

Favorable consideration of this application is requested in view of the foregoing amendments and following remarks. Claims 1-26 are pending.

The Examiner has objected to the drawings for failing to show every feature of the invention specified in the claims. Specifically, the Examiner points to claim 24, which recites a conductive material sensing probe disposed on the platen and an electrically conductive portion of a striker. Claim 24 is hereby amended to overcome this objection. As such, no new drawings are required.

Claim 24 stands rejected under 35 U.S.C. 112, first paragraph as containing subject matter which is not described in the specification. Claim 24 is hereby amended to overcome this rejection. Further, claims 1-26 and specifically claim 1, 9, 16, 24, and 25 have been rejected under 35 U.S.C. 112, second paragraph. The claims are hereby amended to overcome the rejection.

### **Rejections under 35 U.S.C. 102(b)**

Claim 1 stands rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,823,660 to Forthmann. Claim 1, as amended, is directed to a die for cutting a thermoformed plastic article from a sheet of thermoformable plastic. The die being used with a trim press having a die build up plate that is mounted to a first platen, a striker plate that is mounted to a second platen. The trim press moves one of the platens such that the trim press travels between a load position in which a cutting edge is spaced from the striker plate and a cutting position in which the cutting edge confronts the striker plate. The die includes a knife element connected to the die build up plate that includes a cutting edge for severing the thermoformable plastic sheet when the knife element confronts the striker plate and a heater in direct contact with the knife element for heating the knife element.

Forthmann does not teach or suggest a heater in direct contact with the knife element for heating the knife element. In Forthmann the heating element is mounted to the unit 38. Unit 38 is further mounted to the mounting plate 36. The punch 30 having a cutting edge 32 is mounted to the mounting plate 36 opposite the unit 38, see column 3

beginning with line 60-column 4, line 5, as well as Figure 6. The heater of Forthmann resides in unit 38 and does not make direct with the punch. The heater heats unit 38, radiating heat through the mounting plate 36 to the punch 30. As such, Forthmann does not anticipate claim 1 since it fails to teach a heater in direct contact with a knife element. It is respectfully requested that the rejection of claim 1 under 35 U.S.C. 102(b) be withdrawn.

Claims 9, 10, 16, 18, 22, and 23 are rejected under 35 U.S.C. 102 (b) as being anticipated by Rosen (non-patent literature document). Claim 9 recites a die for cutting a thermoformed plastic article from a sheet of thermoformable plastic. The die being used with a trim press having a die build up plate that is mounted to a first platen, a striker plate that is mounted to a second platen. The trim press moves one of the platens such that the trim press travels between a load position in which a cutting edge is spaced from the striker plate and a cutting position in which the cutting edge confronts the striker plate. The die includes a knife element connected to the die build up plate. The knife element includes a cutting edge for severing the thermoformable plastic sheet when the one of the first or second platens is in the cutting position. Further, a die travel stop is included and connected to the die build up plate that engages a surface on the striker plate to limit travel of the trim press when it travels to the cutting position.

The Examiner contends that Rosen discloses the features of claim 9 including a die travel stop mounted to the die build up plate that limits travel of the trim press by engaging a feature on the striker plate when the trim press moves beyond the cutting position. It is respectfully submitted that the Examiner has misconstrued the Rosen reference. Nowhere in the text of Rosen does it mention a die travel stop connected to the die-build up plate. The Examiner is relying on the figures, specifically figure 1 of Rosen, to provide a teaching of the die travel stop. The undersigned spoke with the Examiner upon receipt of the Office Action to point out that Rosen does not disclose a die travel stop. The Examiner apparently construed the “bubbled” thermoformed part in figure 1 as being a die stop. As can be seen in figure 1, the “bubbled” portion of the thermoformed part extends upward between adjacent portions of the cutting instrument. An enlarged version of figure 1 of Rosen is attached and the thermoformed part is highlighted for easier visibility. As is apparent, the thermoformed part is a darker line

along the striker plate and, where the “bubbled” portion extends upward between adjacent portions of the cutting instrument, the line on the striker plate is less dense and smaller, as shown. This clearly shows that the portion of the figure referred to by the Examiner as the die stop is, rather, the “bubbled” portion of the thermoformed part. As such, Rosen neither teaches nor suggest a cutting die having a die travel stop as called for by claim 9. Therefore, claim 9 is not anticipated by the Rosen reference and withdrawal of the rejection is respectfully requested. Further, the features of claim 9 are not obvious in view of Rosen or any additional references cited in the Office Action.

Claim 10 depends from claim 9 and is patentable over the cited reference for the same reasons as claim 9 in view of its additional features. It is respectfully requested that the rejection of claim 9 be withdrawn.

Claim 16 is directed to a die for cutting a thermoformed plastic article from a sheet of thermoformable plastic. The die being used with a trim press having a die build up plate that is mounted to a first platen, a striker plate that is mounted to a second platen. The trim press moves one of the platens such that the trim press travels between a load position in which a cutting edge is spaced from the striker plate and a cutting position in which the cutting edge confronts the striker plate. The die includes a die board moveably mounted to the die build up plate that is moveable within a range of positions on a plane defined by the die build up plate. A knife element is fixed to the die board and includes a cutting edge for severing the thermoformable plastic sheet when the trim press is in the cutting position. Further, a die location pilot is connected to the die board that engages a registration feature associated with the plastic article. When the trim press is in the cutting position, this registration feature co-acts with the die location pilot to move the die board relative to the die build up plate so that the knife element is placed in a predetermined cutting alignment with respect to the plastic article.

The registration feature of Rosen requires the locating pilots in each cavity of the multi-cavity shots to fit the formed profile of the part. In the alternative, Rosen teaches shifting either the mold or die to properly register. However, Rosen does not disclose anywhere in the text or figures a die location pilot connected to the die board that engages a registration feature associated with the plastic article. Nor does Rosen disclose that when the trim press is in the cutting position, the registration feature co-act with the die

location pilot to move the die board relative to the die build up plate so that the knife element is placed in a predetermined cutting alignment with respect to the plastic article. Therefore, Rosen does not teach a die location pilot as claimed in claim 16. It is respectfully requested that the rejection of claim 16 be withdrawn.

Claims 18, 22, and 23 depend from claim 16 and are patentable over the cited reference for the same reasons as claim 16 in view of its additional features. It is respectfully requested that the rejection of these claims be withdrawn.

Rejections under 35 U.S.C. 103(a)

Claims 1-7, 11-13, 19-21, 25, and 26 stand rejected under 35 U.S.C. 130(a) as being unpatentable over Rosen in view of US Patent No. 4,051,754 to Harcuba et al. or Japanese Patent No. JP405154795A to Obara. With regard to claim 1, the details of which are set forth above, the combination of Rosen with either Harcuba or Obara does not teach having the heating element in direct contact with the cutting knife, as called for by claim 1. In Harcuba, the cutting knives are positioned in a tool holder and are heated by a heating plate where the heating plate radiates heat through the tool holder to the cutting knives. The heating plate does not contact with the knives. Further, in Obara, as is apparent from the figure, the heater does not contact the punching edge. As such, having the heating element in direct contact with the knife is not taught by the combination of Rosen with either Harcuba or Obara. Therefore, claim 1 is not obvious and withdrawal of the rejection is respectfully requested.

Claim 2 depends from claim 1 and further requires that the heater is a band that is adhered to the knife element about a substantial portion of its perimeter. The Examiner contends that Rosen as modified by Obara teaches a heater adhered to the knife surface. However, it is clear from the figure that the heater of Obara resides within the punch holder and is not in direct contact with the punch. The heater of Obara consists of several heating elements within the punch holder that must radiate heat through the holder to the punching edge. Further, Obara does not disclose a heater as a band or that the heater extends about the knife element for a substantial portion of its perimeter. Therefore, the combination of Rosen with Obara does not disclose the features of claim 2. As such, the

features of claim 2 are not obvious in view of the cited references and withdrawal of the rejection is respectfully requested.

Claim 5 depend from claim 4 which depends from claim 1 and further requires a die travel stop that includes a post element that is mounted on the die build up plate that limits travel of the trim press to no further than a position at which the cutting edge first contacts the striker plate. The Examiner contends that Rosen teaches a die travel stop that includes a post. However, as stated, there is no reference in Rosen to a die travel stop. As such, claim 5 is patentable over the cited reference.

Claims 2-8, and 26 depend from claim 1 and are patentable over the cited references for the same reasons as claim 1 in view of its additional features. It is respectfully requested that the rejection of these claims be withdrawn.

Claim 11 depends from claim 9 and further requires a knife heater in thermal communication with the knife element. As stated above, Rosen does not teach or suggest a die travel stop connected to the die build up plate that engages a surface on the striker plate to limit travel of the trim press when it travels to the cutting position. The combination of Rosen with either Harcuba or Obara does not disclose the features of claim 9 and claim 11. Therefore, claim 11 is not obvious in view of the cited references and withdrawal of the rejection is respectfully requested.

Claim 12 depends from claim 11 and further requires that the heater is a band that is adhered to the knife element about a substantial portion of its perimeter. The Examiner contends that Rosen as modified by Obara teaches a heater adhered to the knife surface. However, it is clear from the figure that the heater of Obara resides within a punch holder and not in direct contact with the punch. The heater of Obara consists of several heating elements within the punch holder that must radiate heat through the holder to the punching edge. Further, it is not apparent that the heater is a band or that the heater extends about the knife element for a substantial portion of its perimeter. Therefore, the combination of Rosen with Obara does not disclose the features of claim 12. As such, claim 12 is not obvious in view of the cited references and withdrawal of the rejection is respectfully requested.

Claims 12 and 13 depend from claim 11 and are patentable over the cited references for the same reasons as claim 11 in view of its additional features. It is respectfully requested that the rejection of these claims be withdrawn.

Claim 15 depends from claim 14 and further requires the post element include a generally conical recess that engages a protrusion on the plastic sheet to guide the knife element into a predetermined cutting alignment with respect to the outer periphery of the plastic article. The Examiner states that Rosen teaches a post element for engaging a protrusion on the plastic sheet. Nowhere in the Rosen reference is a post element for engaging a protrusion on a plastic sheet disclosed. As such, withdrawal of the rejection is respectfully requested.

Claim 14 depends from claim 10 which depends from claim 9 (set forth above) and 15 depends from claim 14. The claims are patentable over the cited references for the same reasons as claim 9 in view of its additional features. It is respectfully requested that the rejection of these claims be withdrawn.

Claim 17 depends from claim 16 (set forth above) and further requires that the die board include mounting holes that are oversized with respect to mounting posts on the die build up plate so that when the die board is mounted to the die build up plate the die board can slide on the die build up plate within the range defined by the oversized holes. With regard to claim 16, the references alone or in combination neither teach nor suggest a die location pilot connected to the die board that engages a registration feature associated with the plastic article such that when the trim press is in the cutting position, the registration feature co-acts with the die location pilot to move the die board relative to the die build up plate such that the knife element is placed in a predetermined cutting alignment with respect to the plastic article. Further, the references alone or in combination fail to teach the features of claim 17 combined with those of claim 16. As such, claim 17 is not obvious in view of the cited references. Withdrawal of the rejection is respectfully requested.

Claims 17, 19, 20, and 21 depend from claim 16 and are patentable over the cited references for the same reasons as claim 16 in view of its additional features. It is respectfully requested that the rejection of these claims be withdrawn.

Claim 24 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Rosen or Forthmann in view of US Patent Application No. 2002/0166428 to Oh et al. Claim 24 is directed to a die for cutting a thermoformed plastic article from a sheet of thermoformable plastic. The die being used with a trim press having a die build up plate that is mounted to a first platen, a striker plate that is mounted to a second platen. The trim press moves one of the platens such that the trim press travels between a load position in which a cutting edge is spaced from the striker plate and a cutting position in which the cutting edge confronts the striker plate. The die includes a knife element connected to the die platen that defines an outer periphery of the thermoformed plastic article and includes a cutting edge for severing the thermoformed plastic when the die platen confronts the striker platen. Further, the knife acts as a conductive material sensing probe that in the absence of thermoformable plastic the material the knife contacts the striker platen to activate an electrical circuit that provides an indication of the absence of thermoformable plastic.

The Examiner states that Oh further adds to Rosen or Forthmann a conductive material sensing feature of claim 24. However, Oh does not teach or suggest using a knife as a conductive material sensing probe. Oh discloses a wafer sawing apparatus having an electrically conductive chuck table including tactile sensing lines formed in the upper surface of the table where at least one of the sensing lines is electrically connected to the table. In the operation disclosed in Oh, if the scribing blade over-saws the wafer and contacts a tactile sensing line on the chuck table, a signal is sent to a equipment stop unit through the table body and the scribing blade operation is terminated. The tactile sensing lines of Oh do not act to identify the presence or absence of the material to be cut but, rather, identifies an over-sawing by the scribing blade. One of ordinary skill in the art would not be motivated to combine the teachings of Rosen or Forthmann with Oh to create the conductive material sensing probe such as in claim 24.

Moreover, Oh is directed to a non-analogous art. To rely on a reference under 35 U.S.C. 103, the reference must be analogous prior art. MPEP 2141.01(a). In order to rely on a reference as a basis for rejection of the applicant's invention, the reference must either be in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. In re Oetiker, 24 USPQ2d

1443, 1445 (Fed. Cir. 1992). In the present case, one of ordinary skill in the art of thermoforming plastic seeking to solve a problem with identifying the presence of a thermoformed part on a striker plate would not be expected or motivated to look at tactile sensing lines on a chuck table for a sawing apparatus in the semi-conductor manufacturing art. Further, Oh does not even remotely solve the problem of identifying the presence of a thermoformed part on a striker plate even in its respective art. Oh deals with terminating a sawing operation when a blade has reached a certain point in the sawing process by contacting tactile sensing lines in a table top. This is completely different than recognizing the presence of a part in a particular process. Therefore, it is respectfully submitted that Oh cannot be combined with the teachings of Rosen and Forthmann to render claim 24 obvious. A withdrawal of rejection of claim 24 is hereby requested.

Claim 25 stands rejected as being unpatentable over Rosen in view of Harcuba or Obara. Claim 25 is directed to a die for cutting a thermoformed plastic article from a sheet of thermoformable plastic. The die being used with a trim press having a die build up plate that is mounted to a first platen, a striker plate that is mounted to a second platen. The trim press moves one of the platens such that the trim press travels between a load position in which a cutting edge is spaced from the striker plate and a cutting position in which the cutting edge confronts the striker plate. The die includes a die board moveably mounted to the die build up plate wherein the die board includes a plurality of mounting holes that are oversized with respect to mounting posts on the die build up plate such that when the die board is mounted to the die build up plate the die board can slide on the die build up plate within the range defined by the oversized holes. A knife element is affixed to the die board. The knife element has an outer periphery of the thermoformed plastic article and includes a cutting edge for severing the theremoformable plastic sheet when the knife element confronts the striker plate. A heater element is in thermal communication with the knife element for heating the knife element. Further, a die travel stop is mounted to the die board and limits the travel of the trim press by engaging a feature on the striker plate when the trim press is in the cutting position. The die travel stop is a post element and functions as a die location pilot that includes a generally conical recess that engages a protrusion on the plastic sheet to guide the knife element



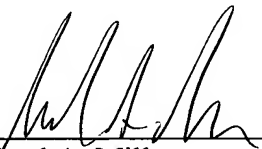
into a predetermined cutting alignment with respect to the outer periphery of the plastic article.

As stated, Rosen does not teach or suggest a post element which acts as a die travel stop and a die location pilot having a conical recess that engages a protrusion on the plastic sheet to guide the knife element into a predetermined cutting alignment with respect to the outer periphery of the plastic article. As such, the combination of Rosen with Obara does not render the features of claim 25 obvious. It is respectfully requested that the rejection to claim 25 be withdrawn.

In view of the foregoing, claims 1-26 are now in condition for allowance. A response to this Amendment in the form of a Notice of Allowance is hereby solicited.

Respectfully submitted,

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# Factors to Consider When Trimming Thin-Gauge Shots Using a Knife

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A knife-like die is only one element among many equally important components that comprise a trim system (Fig. 1). Ideally the knife blade

user may reject these procedures to minimize angel hair procedures.

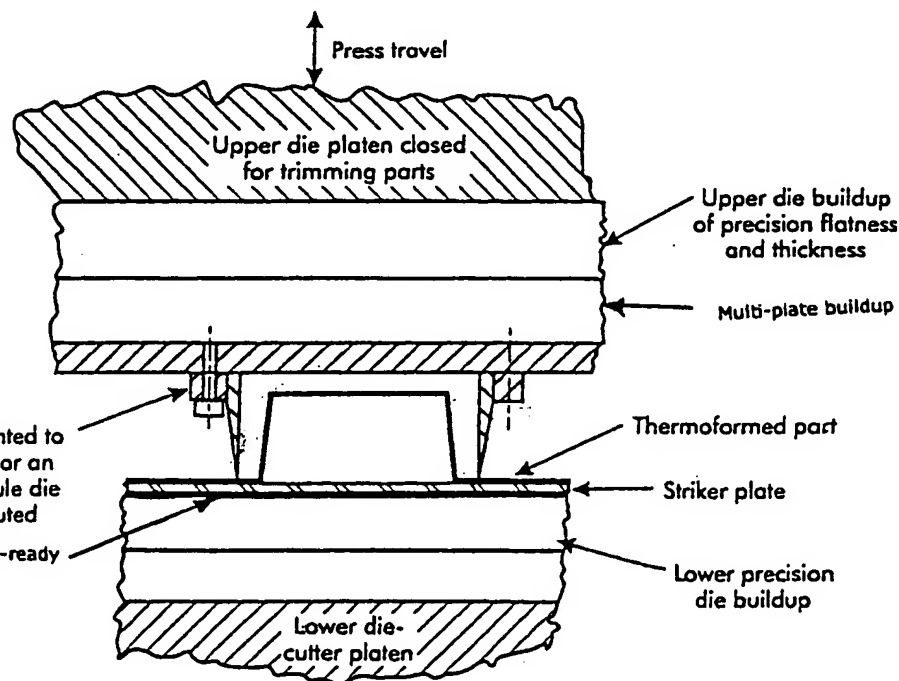


Figure 1. A buildup to support both the die and striker plates to prevent deflecting under a load.

should cut completely through the formed shot without penetrating the underlying striker plate (known as kiss cutting). Trim presses and their die buildups contain many variables that affect the

### Make-Ready Process

1. Reduce press level that will
2. Prepare a heavy act size of the edge as front. Top face of the and die to close an impression. Usually 75% of the paper. If not the *master sheet* striker plate; upon impression on the
3. Obtain 0.002-in make-ready sheeting from a die-